



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

Application No. : 10/583,354  
Confirmation : 9789  
Applicant : Dietmar Spanke et al.  
Filed : June 19, 2006  
Title : Filling level measurement method according to the  
running time principle  
Docket No. : SPAN3008/FJD  
Customer No. : 23364

**BRIEF ON APPEAL**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA. 22202-3514

Sir:

**INTRODUCTORY COMMENTS**

Pursuant to the provisions of 37 CFR 41.37, submitted herewith is Applicant/Appellant's Brief on Appeal along with the required fee. The period for response has been extended to expire on February 28, 2010, by the filing herewith of Petition for a One Month Extension of Time and payment of the required fee.

Any additional fees necessary for this appeal may be charged to the undersigned's Deposit Account No. 02-0200.

**REAL PARTY IN INTEREST**

(37 CFR 41.37(c)(1)(i)

The real party in interest is Applicant/Appellant's assignee Endress + Hauser GmbH + Co. KG. The assignment was recorded on January 31, 2007 at Reel 018957 and Frame 0587.

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## **RELATED APPEALS AND INTERFERENCES**

(37 CFR 41.37(c)(1)(ii))

There are no related appeals or interferences with respect to the invention defined in this application.

## **STATUS OF CLAIMS**

(37 CFR 41.37(c)(1)(iii))

Claims 1 - 20 are pending in this application.

Claims 1 - 10, 12 -16 and 18 have been cancelled.

Claims 11, 17, 18 and 20 have been finally rejected, and as such form the basis of this appeal.

## **STATUS OF AMENDMENTS**

(37 CFR 41.37(c)(1)(iv))

No amendment was filed after issuance of the Office Action of June 29, 2009.

## **SUMMARY OF CLAIMED SUBJECT MATTER**

(37 CFR 41.37 (c)(1)(v))

(References are to page and line of the specification)

The present invention relates to a method for the fill level measurement of a substance in a container using the travel-time principle with contactlessly working, fill level measuring devices. (Pg 1, lines 1 and 2).

There are four (4) claims being considered in this appeal. Of these, claim 11 is in independent form, and appears as follows:

Claim 11. A method for measuring a fill level of a substance in a container using a fill level measuring device operating according to a travel-time principle

(pg 1, lines 1 and 2), comprising the steps of:

    sending periodic transmission signals toward the fill substance (Pg 2, line 23);

    registering and converting their echo signals into an echo function (Pg. 2, line 24); and

    determining at least one echo characteristic of the echo function (Pg. 2, line 25), and, on the basis of echo characteristics of at least one preceding measurement, a prediction is derived for echo characteristics to be expected in the case of a current measurement (Pg. 2, lines 26 - 28), the echo characteristics include travel-time of maxima of the echo function, especially a maxima of fill substance surface, a maxima of a floor of the container or maxima of a fixedly installed disturbance on the basis of travel-time of at least one maximum of a previous measurement (Pg. 2 lines 29 - 30, 32 -33 and Pg. 3, lines 1 and 2), a prediction is made for travel-time of a corresponding maximum to be expected in the case of the current measurement (Pg. 3, lines 4 and 5), wherein:

        the prediction is made for travel-time of the maxima by calculating an instantaneous acceleration and an instantaneous rate of change of the travel-time on the basis of at least three preceding measurements, and the travel-time to be expected is extrapolated on the basis of the acceleration and the rate of change (Pg. 3, lines 13 - 16);

        echo characteristics of the current measurement are determined, taking into consideration the prediction ; and

        on the basis of the echo characteristics, the current fill level is determined. (Pg. 3, lines 28 - 30).

## **GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

(37 CFR 41.37(c)(1)(vi))

Claims 11, 17, 18 and 20 have been finally rejected under 35 USC

103(a) as being unpatentable over Kroemer et al. Claim 18 has also been rejected under 35 USC 103(a) over Kroemer et al in view of Fehrenkamp.

Claim 18 is drafted in dependent form as dependent from claim 11.

## ARGUMENTS

(37 CFR 41.37(c)(1)(vii))

(1)

Claim 11 recites that "the echo characteristics include travel-time of maxima of the echo function, especially a maxima of fill substance surface, a maxima of a floor of the container or maxima of a fixedly installed disturbance on the basis of travel-time of at least one maximum of a previous measurement...." For this recitation, the examiner directs us to column 5, lines 33 - 44 of Kroemer. For convenience, this passage of Kroemer is reproduced here:

time position of the maximum transit time  $t_e$   
signal amplitude  $A_e$  of the maximum  
form factor  $F_e$  (from the 6 dB widths of the maximum).

One recording of the envelope curve is sufficient to simplify the evaluation effort. All features for describing relations between in each case two echoes relative to one another are variables derived therefrom.

Each multiple echo is characterized by the fact that it may be derived from one or more preceding echoes.

From these preechoes, which also may themselves be multiple echoes, it is possible to determine expected values for the features of a multiple echo, having regard to the spatial divergence of...

From the quoted passage, one may ask: where is the passage quoted from claim 11 to be found? It is respectfully submitted that it is not to be found. A feature of claim 11, which the examiner believes is found in Kroemer, is in fact not found in Kroemer. What does this observation do to the noted rejection of claim 11? It is respectfully submitted that it defeats the proposed rejection.

Can it be stated that the quoted passage from claim 11 is impliedly found in Kroemer? We do not see how. There is no mention at all of the three maxima in Kroemer. Accordingly, they cannot be impliedly found in Kroemer.

"To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention ....."*Ex parte Clapp*, 227 USPQ 972 (Bd. Of Pat Ap., 1985).

The examiner refers us to Wikipedia-Polynomial interpolation. It is not clear whether this reference is being used in combination with Kroemer or not. *In re Hoch*, 166 USPQ 406 (CCPA, 1970). In any event, this reference also lacks any teaching of the three maximas noted above. Nothing is changed, therefore, by adding this reference to the rejection

(2)

The Fehrenkamp reference adds nothing to Kroemer in terms of the three maxima noted above. Without a teaching of the three maximas, neither claim 11 or claim 18, which also contains this feature, in addition to further features, cannot be rendered obvious.

In discussing the rejection of claim 18, the examiner states: Kroemer, however, does not explicitly define that the echo characteristic be a travel-time of an echo reflected on the floor of the container." Based on this admission, how can it be suggested that claim 11, which recites this feature, is obvious when considering Kroemer? It is respectfully submitted, that it cannot be so suggested.

## **CONCLUSION**

In view of the above, it is respectfully submitted that claims 11, 17, 18 and 20 should be allowed over the references of record and those applied. The noted rejections should, therefore, be reversed.

Respectfully submitted

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Date: March 1, 2010

  
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APPENDIX OF CLAIMS  
(37 CFR 41.37 (c)(1)(viii))

The claims on appeal are as follows.

11. A method for measuring a fill level of a fill substance in a container using a fill level measuring device operating according to a travel-time principle, comprising the steps of:

    sending periodic transmission signals toward the fill substance;

    registering and converting their echo signals into an echo function; and

    determining at least one echo characteristic of the echo function, and, on the basis of echo characteristics of at least one preceding measurement, a prediction is derived for echo characteristics to be expected in the case of a current measurement, the echo characteristics include travel-time of maxima of the echo function, especially a maxima of fill substance surface, a maxima of a floor of the container or maxima of a fixedly installed disturbance on the basis of travel-time of at least one maximum of a previous measurement, a prediction is made for travel-time of a corresponding maximum to be expected in the case of the current measurement, wherein:

        the prediction is made for travel-time of the maxima by calculating an instantaneous acceleration and an instantaneous rate of change of the travel-time on the basis of at least three preceding measurements, and the travel-time to be expected is extrapolated on the basis of the acceleration and the rate of change;

        echo characteristics of the current measurement are determined, taking into consideration the prediction; and

        on the basis of the echo characteristics, the current fill level is determined.

17. The method as claimed in claim 11 wherein:

an echo characteristic is a travel-time of a wanted echo reflected on the fill substance surface;

a predicted travel-time to be expected for the wanted echo reflected on the fill substance surface in the case of a current measurement is ascertained on the basis of at least one preceding measurement;

that maximum of an echo function for the current measurement is selected whose travel-time has a smallest deviation from the predicted travel-time of the wanted echo reflected on the fill substance surface; and,

taking into consideration the travel-time of this maximum, the current fill level is ascertained.

18. The method as claimed in claim 11, wherein:

an echo characteristic is a travel-time of an echo reflected on the floor of the container;

a predicted travel-time or an estimated value for the travel-time to be expected for the echo reflected on the floor of the container in the case of a current measurement is ascertained on the basis of at least one preceding measurement;

that maximum of an echo function for the current measurement is selected whose travel-time has a smallest deviation from the predicted travel-time of the echo reflected on floor of the container; and,

taking into consideration the travel-time or the estimated value for the travel-time of this maximum, the current fill level is ascertained.

20. The method for measuring a fill level of a fill substance in a container as claimed in claim 11, wherein:

the measured results are continually reviewed for their plausibility.

EVIDENCE APPENDIX

There is no evidence being relied upon which was submitted pursuant to  
37 CFR 1.130, 1.131 or 1.132.

## RELATED PROCEEDINGS APPENDIX

There is no related proceeding being relied upon.

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